



# BGP Flowspec Commands

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This module provides command line interface (CLI) commands for configuring BGP Flowspec on the Cisco CRS Router.

- [class-map type traffic \(BGP-flowspec\), on page 2](#)
- [class type traffic, on page 3](#)
- [drop \(BGP-flowspec\), on page 4](#)
- [flowspec, on page 5](#)
- [flowspec disable, on page 6](#)
- [local-install, on page 7](#)
- [match destination-address, on page 8](#)
- [match destination-port, on page 9](#)
- [match dscp, on page 10](#)
- [match fragment-type, on page 13](#)
- [match icmp code, on page 14](#)
- [match icmp type, on page 15](#)
- [match packet length, on page 16](#)
- [match protocol, on page 17](#)
- [match source-address, on page 19](#)
- [match source-port, on page 20](#)
- [match tcp flag, on page 21](#)
- [policy-map, on page 22](#)
- [redirect \(BGP Flowspec\), on page 24](#)
- [service-policy, on page 25](#)
- [show flowspec, on page 26](#)

## class-map type traffic (BGP-flowspec)

To define a traffic class and the associated rules that match packets to the class, use the **class-map type traffic** command in Global configuration mode. To remove an existing class map from the router, use the **no** form of this command.

**class-map type traffic match-all** *class-map-name*

Syntax Description	match-all	Specifies a match on all of the match criteria.
	<i>class-map-name</i>	Name of the class for the class map.

**Command Default** None

**Command Modes** Global configuration

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This example shows how to specify class305 as the name of a class and defines a class map for this class.

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router (config)# class-map type traffic match-all class305
RP/0/RP0/CPU0:router (config-cmap)# match destination-address ipv4 59.2.1.2 255.255.255.0
```

# class type traffic

To associate a previously configured traffic class with the policy map, and to enter the configuration mode for the specified system class, use the **class type traffic** command in the policy map configuration mode.

**class type traffic** *class-name*

<b>Syntax Description</b>	<i>class-name</i> Name of the class for the class map. The class name is used for the class map and to configure policy for the class in the policy map.				
<b>Command Default</b>	None				
<b>Command Modes</b>	Policy map configuration mode				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 5.2.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 5.2.0	This command was introduced.
Release	Modification				
Release 5.2.0	This command was introduced.				
<b>Usage Guidelines</b>	<p>To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.</p> <p>This example shows how to associate a class map with the policy map:</p> <pre>RP/0/RP0/CPU0:router# config RP/0/RP0/CPU0:router(config)# policy-map type pbr p1 RP/0/RP0/CPU0:router(config-pmap)# class type traffic c1 RP/0/RP0/CPU0:router(config-pmap-c)# set dscp 34</pre>				

## drop (BGP-flowspec)

To configure a traffic class to discard packets belonging to a specific class, use the **drop** command in policy-map class configuration mode. To disable the packet discarding action in a traffic class, use the **no drop** form of this command.

**drop**  
**no drop**

**Syntax Description** This command has no keywords or arguments.

**Command Default** Disabled

**Command Modes** Policy-map class configuration (config-pmap-c)

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

### Examples

This example shows how to discard packets:

```
RP/0/RP0/CPU0:router#config
RP/0/RP0/CPU0:router(config)# policy -map type pbr match_dest_110.1.1.x_drop
RP/0/RP0/CPU0:router(config-pmap)# class type traffic match_dest_110.1.1.x
RP/0/RP0/CPU0:router(config-pmap-c)# drop
```

# flowspec

To enter BGP flowspec configuration mode, use the **flowspec** command in Global configuration mode.

## **flowspec**

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**Syntax Description** This command has no keywords or arguments.

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**Command Default** No default behavior or values

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**Command Modes** Global configuration

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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.2.0	This command was introduced.

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**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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## **Examples**

This example show how to enter flowspec configuration mode.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# flowspec
RP/0/RP0/CPU0:router(config-flowspec)#
```

# flowspec disable

To disable flowspec configuration on all interfaces, use the **flowspec disable** command in interface configuration mode.

**ipv4 | ipv6**  
**flowspec disable**

<b>Syntax Description</b>	<b>ipv4</b>	Specifies IPv4 interfaces.
	<b>ipv6</b>	Specifies IPv6 interfaces.
<b>Command Default</b>	No default behavior or values	
<b>Command Modes</b>	Interface configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

## Examples

This example shows how to disable flowspec configuration on all interfaces.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface GigabitEthernet 0/2/0/2
RP/0/RP0/CPU0:router(config-if)# ipv4 flowspec disable
```

# local-install

To apply local installation of flowspec policy on all interfaces, use the **local-install** command in appropriate command mode.

**local-install interface-all**

<b>Syntax Description</b>	<b>interface-all</b> Installs flowspec policy on all interfaces.
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<b>Command Default</b>	No default behavior or values
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<b>Command Modes</b>	IPv4 address family configuration IPv6 address family configuration VRF IPv4 address family configuration VRF IPv6 address family configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.2.0	This command was introduced.

<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.
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<b>Examples</b>	This example show how to install flowspec policy on all interfaces under flowspec subaddress family configuration mode.
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```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# flowspec
RP/0/RP0/CPU0:router(config-flowspec)# address-family ipv4
RP/0/RP0/CPU0:router(config-flowspec-af)# local-install interface-all
```

## match destination-address

To identify a specific destination IP address explicitly as a match criterion in a class map, use the **match destination-address** command in the class map configuration mode. To remove a specific destination IP address from the matching criteria for a class map, use the **no** form of this command.

```
match destination-address {ipv4 | ipv6} address
no match destination-address {ipv4 | ipv6} address
```

<b>Syntax Description</b>	<b>ipv4</b> Indicates an IPv4 address.				
	<b>ipv6</b> Indicates an IPv6 address.				
	<i>address</i> Specifies a destination address.				
<b>Command Default</b>	No default behavior or values				
<b>Command Modes</b>	Class map configuration				
<b>Command History</b>	<table border="1"> <thead> <tr> <th style="border-bottom: 1px solid black;">Release</th> <th style="border-bottom: 1px solid black;">Modification</th> </tr> </thead> <tbody> <tr> <td style="border-bottom: 1px solid black;">Release 5.2.0</td> <td style="border-bottom: 1px solid black;">This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 5.2.0	This command was introduced.
Release	Modification				
Release 5.2.0	This command was introduced.				
<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.				

### Examples

This example shows how to match a destination ipv4 address:

```
RP/0/RP0/CPU0:router(config)#class-map type traffic match-all
RP/0/RP0/CPU0:router(config-cmap)# match destination-address ipv4 59.2.1.2 255.255.255.0
```



# match destination-port

To identify a specific destination port as the match criterion for a class map, use the **match destination-port** command in class map configuration mode. To remove destination port-based match criteria from a class map, use the **no** form of this command.

```
match destination-port {destination-port-value | [min-value - max-value]}
```

```
no match destination-port {destination-port-value | [min-value - max-value]}
```

Syntax Description	
<i>destination-port-value</i>	A port Number. Range is from 0 to 65535.
<i>min-value</i>	Lower limit of destination port range to match. Value range is 0 to 65535.
<i>max-value</i>	Upper limit of destination port range to match. Value range is 0 to 65535.

**Command Default** No default behavior or values

**Command Modes** Class map configuration

Command History	Release	Modification
	Release 5.2.0	The <i>min-value</i> and <i>max-value</i> variables were added.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Examples** This example shows how to match a destination port:

```
RP/0/RP0/CPU0:router(config)# class-map type traffic match-all
```

```
RP/0/RP0/CPU0:router(config-cmap)# match destination-port 1
```

# match dscp

To identify specific IP differentiated services code point (DSCP) values as match criteria for a class map, use the **match dscp** command in class map configuration mode. To remove a DSCP value from a class map, use the **no** form of this command.

```
match dscp [{ipv4 | ipv6}] dscp-value [dscp-value1 . . . dscp-value7] |[min-value - max-value]}
no match dscp [{ipv4 | ipv6}] dscp-value [dscp-value1 . . . dscp-value7] |[min-value -
max-value]}

```

## Syntax Description

**not** (Optional) Negates the specified match result.

**ipv4** (Optional) Specifies the IPv4 DSCP value.

**ipv6** (Optional) Specifies the IPv6 DSCP value.

*dscp-value* IP DSCP value identifier that specifies the exact value or a range of values. Range is 0 - 63. Up to eight IP DSCP values can be specified to match packets. Reserved keywords can be specified instead of numeric values. [Table 1: IP DSCP Reserved Keywords, on page 11](#) describes the reserved keywords.

*min-value* Lower limit of DSCP range to match. Value range is 0 - 63.

*max-value* Upper limit of DSCP range to match. Value range is 0 - 63.

## Command Default

Matching on IP Version 4 (IPv4) and IPv6 packets is the default.

## Command Modes

Class map configuration

## Command History

Release	Modification
Release 2.0	This command was introduced.
Release 3.2	The <b>ipv6</b> and <b>ipv4</b> keywords were added.
Release 3.3.0	The <b>not</b> keyword was added.
Release 5.2.0	The <i>min-value</i> and <i>max-value</i> variables were added.

## Usage Guidelines

The **match dscp** command specifies a DSCP value that is used as the match criteria against which packets are checked to determine if they belong to the class specified by the class map.

To use the **match dscp** command, you must first enter the **class-map** command to specify the name of the class whose match criteria you want to establish. If you specify more than one **match dscp** command in a class map, only the last command entered applies.

The **match dscp** command examines the higher-order six bits in the type of service (ToS) byte of the IP header. Only one of the eight values is needed to yield a match (OR operation).

The command supports only eight IP DSCP values. If you try to configure more match statements after all the eight values are matched, the statements get rejected.

The IP DSCP value is used as a matching criterion only. The value has no mathematical significance. For instance, the IP DSCP value 2 is not greater than 1. The value simply indicates that a packet marked with the IP DSCP value of 2 should be treated differently than a packet marked with an IP DSCP value of 1. The treatment of these marked packets is defined by the user through the setting of policies in policy map class configuration mode.

**Table 1: IP DSCP Reserved Keywords**

DSCP Value	Reserved Keyword
0	default
10	AF11
12	AF12
14	AF13
18	AF21
20	AF22
22	AF23
26	AF31
28	AF32
30	AF33
34	AF41
36	AF42
38	AF43
46	EF
8	CS1
16	CS2
24	CS3
32	CS4
40	CS5
48	CS6
56	CS7
ipv4	ipv4 dscp

DSCP Value	Reserved Keyword
ipv6	ipv6 dscp

Task ID	Task ID	Operations
	qos	read, write

### Examples

This example shows how to configure the service policy called policy1 and attach service policy policy1 to an interface. In this example, class map dscp14 evaluates all packets entering Packet-over-SONET/SDH (POS) interface 0/1/0/0 for an IP DSCP value of 14. If the incoming packet has been marked with the IP DSCP value of 14, the packet is queued to the class queue with the bandwidth setting of 300 kbps.

```
RP/0/RP0/CPU0:router(config)# class-map dscp14
RP/0/RP0/CPU0:router(config-cmap)# match dscp ipv4 14
RP/0/RP0/CPU0:router(config-cmap)# exit

RP/0/RP0/CPU0:router(config)# policy-map policy1
RP/0/RP0/CPU0:router(config-pmap)# class dscp14
RP/0/RP0/CPU0:router(config-pmap-c)# bandwidth 300
RP/0/RP0/CPU0:router(config-pmap-c)# exit
RP/0/RP0/CPU0:router(config-pmap)# exit

RP/0/RP0/CPU0:router(config)# interface pos 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# service-policy input policy1
```

## match fragment-type

To identify a fragment-type as the match criterion for a class map, use the **match fragment-type** command in class map configuration mode. To remove fragment-type match criteria from a class map, use the **no** form of this command.

```
match fragment type [dont-fragment] [first-fragment] [is-fragment] [last-fragment]
no match fragment type [dont-fragment] [first-fragment] [is-fragment] [last-fragment]
```

Syntax Description	
<b>dont-fragment</b>	Matches dont-fragment bit.
<b>first-fragment</b>	Matches first-fragment bit.
<b>is-fragment</b>	Matches is-fragment bit.
<b>last-fragment</b>	Matches last-fragment bit.

**Command Default** No default behavior or values

**Command Modes** Class map configuration

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Examples** This example shows how to match a fragment-type:

```
RP/0/RP0/CPU0:router(config)# class-map type traffic match-all
RP/0/RP0/CPU0:router(config-cmap)# match fragment-type is-fragment
```

## match icmp code

To identify an ICMP (Internet Control Message Protocol) code as the match criterion for a class map, use the **match icmp type** command in the class map configuration mode. To remove the icmp code-based match criteria from a class map, use the **no** form of this command.

```
match {ipv4 | ipv6} icmp-code {value | [min-value - max-value]}
```

```
no match {ipv4 | ipv6} icmp-code {value | [min-value - max-value]}
```

Syntax Description		
	<b>ipv4</b>	Indicates an IPv4 ICMP code.
	<b>ipv6</b>	Indicates an IPv6 ICMP code.
	<i>min-value</i>	Lower limit of ICMP type range to match. Value range is 0 to 255.
	<i>max-value</i>	Upper limit of ICMP type range to match. Value range is 0 to 255.

**Command Default** No default behavior or values

**Command Modes** Class map configuration

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

### Examples

This example shows how to match an IPv4 ICMP code:

```
RP/0/RP0/CPU0:router(config)# class-map type traffic match-all
RP/0/RP0/CPU0:router(config-cmap)# match ipv4 icmp-code 1
```

## match icmp type

To identify an ICMP (Internet Control Message Protocol) type as the match criterion for a class map, use the **match icmp type** command in class map configuration mode. To remove the icmp type-based match criteria from a class map, use the **no** form of this command.

```
match {ipv4 | ipv6} icmp-type {value | [min-value - max-value]}
```

```
no match {ipv4 | ipv6} icmp-type {value | [min-value - max-value]}
```

Syntax Description	
<b>ipv4</b>	Indicates an IPv4 ICMP type.
<b>ipv6</b>	Indicates an IPv6 ICMP type.
<i>min-value</i>	Lower limit of ICMP type range to match. Value range is 0 to 255.
<i>max-value</i>	Upper limit of ICMP type range to match. Value range is 0 to 255.

**Command Default** No default behavior or values

**Command Modes** Class map configuration

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Examples** This example shows how to match an IPv4 ICMP type:

```
RP/0/RP0/CPU0:router(config)# class-map type traffic match-all
```

```
RP/0/RP0/CPU0:router(config-cmap)# match ipv4 icmp-type 1
```

# match packet length

To specify the packet length in the IP header as a match criterion in a class map, use the **match packet length** command in class-map configuration mode. To remove a previously specified packet length as a match criterion, use the **no** form of this command.

```
match packet length {value | [min-value - max-value]}
no match packet length {value | [min-value - max-value]}
```

Syntax Description	
<i>value</i>	IP packet length. Range is from 0 to 65535.
<i>min-value</i>	Minimum length value to match. Value range is 0 to 65535.
<i>max-value</i>	Minimum length value to match. Value range is 0 to 65535.

**Command Default** No default behavior or values.

**Command Modes** Class map configuration

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

**Examples** This example shows how to match a packet length value:

```
RP/0/RP0/CPU0:router(config)# class-map type traffic match-all
RP/0/RP0/CPU0:router(config-cmap)# match packet length 3
```



# match protocol

To identify a specific protocol as the match criterion for a class map, use the **match protocol** command in class map configuration mode. To remove protocol-based match criteria from a class map, use the **no** form of this command.

```
match [not] protocol {protocol-value [protocol-value1 . . . protocol-value7] | [min-value - max-value]}
```

```
no match [not] protocol {protocol-value [protocol-value1 . . . protocol-value7] | [min-value - max-value]}
```

Syntax Description	not	(Optional) Negates the specified match result.
	<i>protocol-value</i>	A protocol identifier. A single value for <i>protocol-value</i> (any combination of numbers and names) can be matched in one match statement.
	<i>min-value</i>	Lower limit of protocol range to match. Value range is 0 - 255.
	<i>max-value</i>	Upper limit of protocol range to match. Value range is 0 - 255.

**Command Default** No default behavior or values

**Command Modes** Class map configuration

Command History	Release	Modification
	Release 2.0	This command was introduced.
	Release 3.3.0	The <b>not</b> keyword was added.
	Release 5.2.0	The <i>min-value</i> and <i>max-value</i> variables were added.

**Usage Guidelines** Definitions of traffic classes are based on match criteria, including protocols, access control lists (ACLs), input interfaces, QoS labels, and experimental (EXP) field values. Packets satisfying the match criteria for a class constitute the traffic for that class.

The **match protocol** command specifies the name of a protocol to be used as the match criteria against which packets are checked to determine if they belong to the class specified by the class map. Available protocol names are listed in the table that follows.

The *protocol-value* argument supports a range of protocol numbers. After you identify the class, you may use the **match protocol** command to configure its match criteria.

**Table 2: Protocol Names and Descriptions**

Name	Description
ahp	Authentication Header Protocol
eigrp	Cisco Enhanced Interior Gateway Routing Protocol

Name	Description
esp	Encapsulation Security Payload
gre	Cisco Generic Routing Encapsulation Tunneling
icmp	Internet Control Message Protocol
igmp	Internet Gateway Message Protocol
igrp	Cisco IGRP Routing protocol
ipinip	IP in IP tunneling
ipv4	Any IPv4 protocol
ipv6	Any IPv6 protocol
mpls	Any MPLS packet
nos	KA9Q NOS Compatible IP over IP Tunneling
ospf	Open Shortest Path First, Routing Protocol
pcp	Payload Compression Protocol
pim	Protocol Independent Multicast
sctp	Stream Control Transmission Protocol
tcp	Transport Control Protocol
udp	User Datagram Protocol

**Task ID****Task ID**    **Operations**

qos	read, write
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**Examples**

In this example, all TCP packets belong to class class1:

```
RP/0/RP0/CPU0:router(config)# class-map class1
RP/0/RP0/CPU0:router(config-cmap)# match protocol tcp
```

## match source-address

To identify a specific source IP address explicitly as a match criterion in a class map, use the **match source-address** command in the class map configuration mode. To remove a specific source IP address from the matching criteria for a class map, use the **no** form of this command.

```
match source-address {ipv4 | ipv6} address
no match source-address {ipv4 | ipv6} address
```

Syntax Description	
<b>ipv4</b>	Indicates an IPv4 address.
<b>ipv6</b>	Indicates an IPv6 address.
<i>address</i>	Specifies a source address.

**Command Default** No default behavior or values

**Command Modes** Class map configuration

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

### Examples

This example shows how to match a source ipv4 address:

```
RP/0/RP0/CPU0:router(config)#class-map type traffic match-all A
RP/0/RP0/CPU0:router(config-cmap)# match source-address ipv4 59.2.1.2 255.255.255.0
```

## match source-port

To identify a specific source port as the match criterion for a class map, use the **match source port** command in class map configuration mode. To remove source port-based match criteria from a class map, use the **no** form of this command.

```
match source-port {source-port-value | [min-value - max-value]}
```

```
no match source-port {source-port-value | [min-value - max-value]}
```

### Syntax Description

*source-port-value* A port Number. Range is from 0 to 65535.

*min-value* Lower limit of source port range to match. Value range is 0 to 65535.

*max-value* Upper limit of source port range to match. Value range is 0 to 65535.

### Command Default

No default behavior or values

### Command Modes

Class map configuration

### Command History

Release	Modification
Release 5.2.0	This command was introduced.

### Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

### Examples

This example shows how to match a source port:

```
RP/0/RP0/CPU0:router(config)# class-map type traffic match-all
RP/0/RP0/CPU0:router(config-cmap)# match source-port 1
```

# match tcp flag

To identify a TCP flag as the match criterion for a class map, use the **match tcp flag** command in class map configuration mode. To remove the tcp flag based match criteria from a class map, use the **no** form of this command.

```
match tcp-flag value any
no match tcp-flag valueany
```

<b>Syntax Description</b>	<i>value</i> TCP flag value. Range is from 1 to 4095 (hexadecimal).
	<b>any</b> Specifies a match based on any bit in the TCP flag.

<b>Command Default</b>	No default behavior or values
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<b>Command Modes</b>	Class map configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 5.2.0	This command was introduced.

<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.
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<b>Examples</b>	This example shows how to match a TCP flag:
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```
RP/0/RP0/CPU0:router(config)# class-map type traffic match-all
RP/0/RP0/CPU0:router(config-cmap)# match tcp flag 2 any
```

# policy-map

To create or modify a policy map that can be attached to one or more interfaces to specify a service policy, use the **policy-map** command in Global Configuration mode. To delete a policy map, use the **no** form of this command.

```
policy-map [type qos] policy-name
no policy-map [type qos] policy-name
```

Syntax Description		
	<b>type qos</b>	(Optional) Specifies type of the service policy.
	<b>qos</b>	(Optional) Specifies a quality-of-service (QoS) policy map.
	<b>pbr</b>	(Optional) Specifies a policy-based routing (PBR) policy map.
	<i>policy-name</i>	Name of the policy map.

**Command Default** A policy map does not exist until one is configured. Because a policy map is applied to an interface, no restrictions on the flow of data are applied to any interface until a policy map is created.

Type is QoS when not specified.

**Command Modes** Global Configuration mode

Command History	Release	Modification
	Release 2.0	This command was introduced.
	Release 3.3.0	Maximum number of classes permitted per policy map was increased to 32.
	Release 3.6.0	The <b>type qos</b> keywords were added. Maximum number of classes permitted per policy map was increased to 512.
	Release 5.2.0	The <b>pbr</b> keyword was added.

**Usage Guidelines** Use the **policy-map** command to specify the name of the policy map to be created, added to, or modified before you can configure policies for classes whose match criteria are defined in a class map. Entering the **policy-map** command enables policy map configuration mode in which you can configure or modify the class policies for that policy map.

You can configure class policies in a policy map only if the classes have match criteria defined for them. Use the **class-map** and **match** commands to configure the match criteria for a class. Because you can configure a maximum of 1024 classes in one policy map, no policy map can contain more than 1024 class policies. The maximum number of 1024 classes per policy includes the implicit default class and its child policies.

A single policy map can be attached to multiple interfaces concurrently.

Task ID	Task ID	Operations
	qos	read, write

### Examples

These examples show how to create a policy map called policy1 and configures two class policies included in that policy map. The policy map is defined to contain policy specification for class1 and the default class (called class-default) to which packets that do not satisfy configured match criteria are directed. Class1 specifies policy for traffic that matches access control list 136.

```
RP/0/RP0/CPU0:router(config)# class-map class1
RP/0/RP0/CPU0:router(config-cmap)# match access-group ipv4 136

RP/0/RP0/CPU0:router(config)# policy-map policy1
RP/0/RP0/CPU0:router(config-pmap)# class class1

RP/0/RP0/CPU0:router(config-pmap-c)# police cir 250
RP/0/RP0/CPU0:router(config-pmap-c)# set precedence 3
RP/0/RP0/CPU0:router(config-pmap-c)# exit

RP/0/RP0/CPU0:router(config-pmap)# class class-default
RP/0/RP0/CPU0:router(config-pmap-c)# queue-limit bytes 1000000
```

## redirect (BGP Flowspec)

To route the policy based routing (PBR) traffic to distributed denial-of-service scrubber (DDoS), use the **redirect** command in policy-map configuration mode. To return the PBR traffic to normal route, use the **no** form of this command.

```
redirect {default-route | nexthop } {IPv4-address IPv6-address | route-target {AS-number: index
IPv4-address: index } | vrf vrf-name }
no redirect [ default-route | nexthop ]
```

Syntax Description	Parameter	Description
	<b>default-route</b>	Forwards to the default nexthop for this packet
	<b>nexthop</b>	Forwards to specified nexthop
	<i>IPv4 address</i>	Input IPv4 Nexthop address
	<i>IPv6 address</i>	Input IPv6 Nexthop address
	<b>route-target</b>	Enter specific route-target string
	<i>AS-number: index</i>	Enter 2-byte or 4-byte autonomous system number (AS) and <i>index</i> in hexa decimal or decimal format.
	<i>IPv4-address: index</i>	Enter IPv4 address and <i>index</i> in hexa decimal or decimal format.
	<b>vrf</b> <i>vrf-name</i>	Enter specific VRF name for the nexthop.

**Command Default** None

**Command Modes** Policy-map configuration

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** You must be in a user group associated with a task group that includes the proper task IDs. The command reference guides include the task IDs required for each command. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The example shows how to redirect PBR traffic to virtual routing and forwarding (VRF) instance:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# policy-map type pbr test1
RP/0/RP0/CPU0:router(config-pmap)# class type traffic test1
RP/0/RP0/CPU0:router(config-pmap-c)# redirect nexthop vrf vrf1
```



# service-policy

To configure service policy on a flowspec subaddress family interface, use the **service-policy** command in appropriate command mode.

```
service-policy type pbr policy-name
```

Syntax Description	type	Specifies type of the service policy.
	<b>pbr</b>	Specifies a policy-based routing (PBR) policy map.
	<i>policy-name</i>	Name of the policy map.

**Command Default** No default behavior or values

**Command Modes**

- IPv4 address family configuration
- IPv6 address family configuration
- VRF IPv4 address family configuration
- VRF IPv6 address family configuration

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

## Examples

This example shows how to setup service policy.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# flowspec
RP/0/RP0/CPU0:router(config-flowspec)# address-family ipv4
RP/0/RP0/CPU0:router(config-flowspec-af)# service-policy type pbr policy100
```

# show flowspec

To display flowspec policy information for an interface, use the **show flowspec** command in EXEC mode.

**show flowspec** {**afi-all** | **client** | **ipv4** | **ipv6** | **summary** | **vrf**}

Syntax Description		
<b>afi-all</b>		Displays flowspec policy applied on IPv4 and IPv6 interfaces.
<b>client</b>		Displays flowspec client interfaces.
<b>ipv4</b>		Displays flowspec policy applied on IPv4 interfaces.
<b>ipv6</b>		Displays flowspec policy applied on IPv6 interfaces.
<b>summary</b>		Displays flowspec policy summary on all interfaces.
<b>vrf</b>		Displays flowspec policy applied on VRF interfaces.

**Command Default** No default behavior or values

**Command Modes** EXEC

Command History	Release	Modification
	Release 5.2.0	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

## Examples

This example shows sample output from **show flowspec** command when **vrf**, **ipv4** and **summary** keywords are used.

```
RP/0/RP0/CPU0:router# show flowspec vrf vrf1 ipv4 summary
Mon May 19 12:59:41.226 PDT
Flowspec VRF+AFI table summary:
VRF: vrf1
  AFI: IPv4
    Total Flows:          3
    Total Service Policies: 1
```